CLEAN VERSION OF ALL PENDING CLAIMS

1. Camera system comprising a camera (1) provided with an optics system (2) and a photosensitive image surface (3) disposed near the optics system symmetrically relative to its optic axis (L), the image of the object (K) refracted by the optics being projected onto the image surface, the photosensitive image surface (3) being a concave spherical surface whose center of curvature is at the focal point of the optics (2) and consisting of a matrix of individual photosensitive detecting elements, characterized in that the detecting elements are so arranged on the image surface (3) that their density is at a maximum on the optic axis (L) and diminishes from the optic axis toward the edge zones.

2. Camera system as defined in claim 1, characterized in that the density distribution of the detecting elements on the image surface (3) is consistent with the function:

$$I(r) = I_0 e^{-a\left(\frac{\sqrt{x^2+y^2+z^2}}{r_0}\right)^2},$$

where

I_0 = density of detecting elements at the origin (on the optic axis),

$I(r)$ = local density of detecting elements at radius r from the origin, and

a = scaling factor.

3. Camera system as defined in claim 1, characterized in that photosensitive detecting elements are CCD elements.

4. Camera system as defined in claim 1, characterized in that the number of detecting elements is of the order of 100000 or higher.

5. Camera system as defined in claim 4, characterized in that the number of detecting elements has been so chosen that, to achieve a reasonable image quality, the number is of the order of 10^4 - 3×10^4, to achieve a good image quality, of the order of 10^6 - 2×10^6, or to achieve a perfect image quality, of the order of 10^8.

6. Camera system as defined in claim 1, characterized in that the optics (2) has been so arranged that, in the high-resolution area near the optic axis (L), the point spread function (PSF) produced by the optics integrates over several detecting elements to prevent aliasing.

7. Camera system as defined in claim 1, characterized in that the optics (2) is of a type having a so-called normal focal distance and the image surface (3) is a spherical calotte with a recording angle of the order of 60°; and that the camera comprises a shutter (4) disposed between the optics and the image surface and provided with an adjustable aperture.

8. Camera system as defined in claim 1, characterized in that the recording angle of the image surface (3) is 180° or less.

9. Camera system as defined in claim 1, characterized in that the optics (2) comprises a lens (5) with a short focal distance, such as a so-called fish-eye lens; that the image surface (3) is of a hemispherical shape and the recording angle is 180°, the camera thus being of a semispace recording type.

10. Camera system as defined in claim 1, characterized in that the camera (1) is a digital camera which comprises means for digitization of the signals received from the detecting elements and means for transferring the digitized images to a computer.

11. Camera system as defined in claim 1, characterized in that the camera (1) is of a type for recording moving pictures.

12. Camera system as defined in claim 1, characterized in that the camera (1) is of a type for recording still pictures.

13. Camera system as defined in claim 1, characterized in that the camera (1) is a monitoring camera.

14. Camera system as defined in claim 1, characterized in that the system comprises two semispace recording cameras (1) directed in opposite directions for the recording of the whole space.

15. Camera system as defined in claim 1, characterized in that the system comprises two adjacent semispace recording cameras (1) directed in the same direction for the recording of a stereo image of the semispace.

16. Display device (6) for displaying an image recorded by a camera system as defined in claim 1 on the display surface (7) of the display device, characterized in that the display surface (7) is a concave spherical surface.

17. Display device as defined in claim 16, characterized in that the display device (6) is a monitor, such as a computer monitor or a television, the screen of which is a display surface (7) having the shape of a concave spherical calotte.

18. Display device as defined in claim 16, characterized in that the display surface (7) is a wall or ceiling surface of a room, onto which an image can be projected so as to allow it to be viewed simultaneously by a plurality of persons.

19. Display device as defined in claim 16, characterized in that the display device is a personal display visor or the like, in which the display surface (7) is a hemispherical display surface having its center at the focal point of the eye.

20. Display device as defined in claim 19, characterized in that the display visor or the like comprises two hemispherical display surfaces (7) with their centers at the focal points of the eyes, one display surface being provided for each eye for the viewing of stereo images.

21. Display device as defined in claim 16, characterized in that the display surface (7) consists of a matrix of individual picture elements.

22. Display device as defined in claim 21, characterized in that the number of picture elements is of the order of 100000 or higher.

23. Display device as defined in claim 21, characterized in that the number of picture elements has been so chosen that, in order to achieve a reasonable image quality, the number is of the order of 10^4 - 3×10^4, to achieve a good image quality, of the order of 10^6 - 2×10^6, or to achieve a perfect image quality, of the order of 10^8.

24. Display device as defined in claim 21, characterized in that the picture elements are so arranged on the display surface (7) that their density is at a maximum on the optic axis (L) and diminishes from the optic axis toward the edge zones.

25. Display device as defined in claim 24, characterized in that the picture elements of the hemispherical display surface (7) are larger in surface area in the edge zones than in the vicinity of the optic axis (L).

26. Display device as defined in claim 24, characterized in that the density distribution of the picture elements on the display surface is consistent with the function:

$$I(r) = I_0 e^{-a\left(\frac{\sqrt{x^2+y^2+z^2}}{r_0}\right)^2},$$

where

I_0 = picture element density at the origin (on the optic axis),

$I(r)$ = local picture element density at radius r from the origin, and

a = scaling factor.

27. Display device as defined in claim 21, characterized in that the picture elements are implemented using fiber optics.